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Chemophobia and the Fairytale of ALL NATURAL Cosmetics

Introduction

Natural personal care, once a niche market is now the fastest growing sector of the \$180 billion (Kline & Company) personal care industry. With the largest market shares in the USA and Europe the global market turnover enjoyed a 15% growth (Kline & Company) and reached the pride sum of \$ 7(IRI) billion in 2007. Only in Germany the consumer spent 613 million Euro for natural cosmetics in 2007. According to IRI (Information Resources Inc.) every second woman in Germany buys a natural product at least once in a month and every fourth woman buys regularly natural personal care products. In France and in the UK, 21% and 12% of the consumer use regularly natural personal care products (Mintel) **(Figure 1)**.

Natural products belong not any more to the drugstores and specialty departments,

you can find them even in supermarket shelves and discounter shops.

The market is largely unregulated, the consumer is confused with INCI names (thanks to the Cosmetic Directive of the European Union) or nature friendly ingredients names – coconut emulsifier, Amazon extract – and the variety of promising so-called “quality seals” and is cheated with the absurd, non realistic publicity. The products – even discounter labels – are much more expensive than the traditional “petroleum based” products, but none of these circumstances can slow down the growth of the “green business”.

Why are consumers so possessed of natural products?

Chemophobia, adventurous journalists who read only a few sentences out of a scientific report and interpret it as they will and misinformed politicians contribute to the in-

creasing fear from chemicals and subsequently to the explosive growth of the “GREEN; free of chemicals” business.

“Natural products” would at least cause no harm even if they don’t perform the miracles they claim, believes the loyal consumer of “green products”.

About 50% of the consumer of natural products believe they are free from harmful ingredients and unnecessary chemicals (Mintel, Dec. 2007) **(Figure 2)**.

Chemophobia

Thanks to the internet, we are bombarded every day with horror reports informing us about dangerous, carcinogenic or mutagenic chemicals found in agricultural products, food and most often in personal care products and cosmetics. These revealing reports are more easily accessible and understandable by the public (the majority of

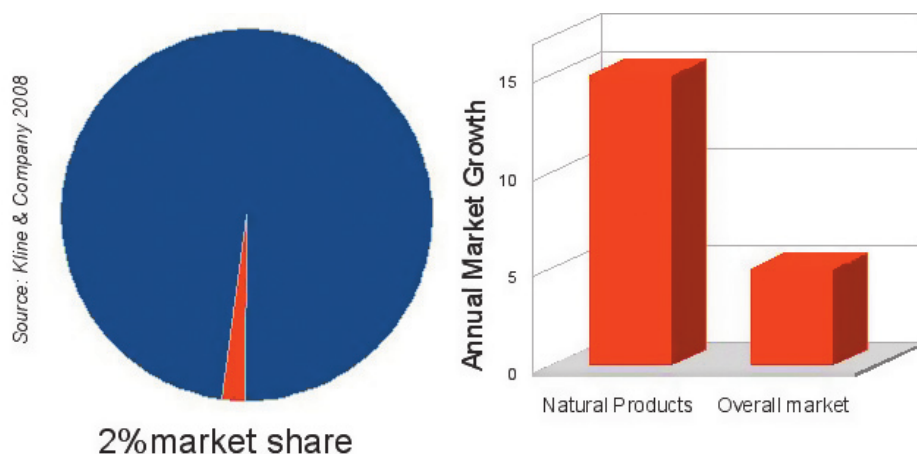


Figure 1 | Market share and market growth for natural personal care products.



Figure 2 | What the consumer think about the natural products.

the consumer) than the professional articles in scientific journals with a few hundred dollars subscription fees per year.

As an example let us begin with one of the most notorious ingredients in the modern personal care products industry, the paraben family.

The drama began in 1998 with studies on the estrogenic activities of the parabens [1] and the successive articles of P. Darbre: "Oestrogenic activity of isobutylparaben *in vitro* and *in vivo*" [2], "Underarm cosmetics

are a cause of breast cancer" [3] and "Concentrations of Parabens in Human Breast Tumors" [4] in 2004. This latter article, or rather only the title of the article – whose methodology and conclusions were severely criticized [5,6] by the scientific society, distributed and misinterpreted overnight via easily accessed weblogs and magazines [7-10] – ruined the fame of the antiperspirants as a personal care product and the paraben family as one of the safest preservatives for personal care and cosmetics.

Responding to scientific objections [11], madame Darbre stated finally: "No claim was made that the presence of parabens had caused the breast cancers". This statement and other articles insisting on the absurdity of internet rumors [12, 13], as well as the statements of the SCCP [14] in 2005, the BfR in Germany in 2004 [15] and the ACSH (American council on science and health) [16] insisting on safety of parabens didn't change anything in the destiny of parabens. "Paraben-free" is still one of the most powerful marketing tools in the personal care industry. Unfortunately the power of the nonscientific Weblogs is greater than the logic of the science. The environmental activists and anticancer NGOs even have a race in exaggerating and manipulating the reports: "Can the Methyl Paraben in Your Shampoo Make You Fat?" [17] (**Figure 3**) and "parabens cause excessive aging of skin" [18].

The following headlines are only a representative example of the daily alarms in popular media:

The Dark Side of Sunscreens – *Washington post*, June 29, 2008 [19]

...Some studies have linked specific chemical UV filters with the transsexualization of male fish and coral reef degradation. They've also been associated with hormone-disrupting activity in lab tests...

Can the Methyl Paraben in Your Shampoo Make You Fat?

"The EPA found synthetic hormone-disrupting chemicals in shampoo preservatives, hair coloring agents, sunscreens, -----"

The World Health Organization estimated that, in 1995, there were 200 million obese adults worldwide. By 2000, that number had grown to 300 million. It is very strange, indeed, that this epidemic coexists with undernutrition, affecting nearly every nation, rich or poor, and that it is affecting women more than men. What is causing this rapidly increasing global obesity epidemic?

Over the past decade, the United States has been urgently investigating the effects of low levels of synthetic personal care product chemicals found in our water – lakes, rivers, oceans.

Scientists around the world have now linked these chemicals from personal care products to a growing

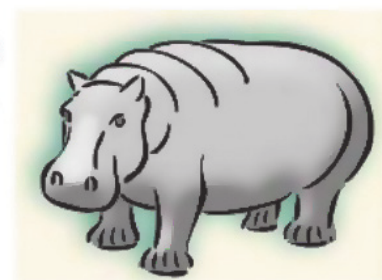


Figure 3 | An interesting title from one of the USDA certified natural products manufacturer about parabens.

Asthmatics Should Look for Fakegrances (fake fragrances) as Causes – *Natural News*, August 11, 2008 [20]

...according to the Environmental Working Group, "Fragrance formulas are considered to be among the top five known allergens and can trigger asthma attacks."

Pesticides Found In Soap, Toothpaste And Toys, *EWG*, July 17, 2008 [21]

Babies May Be Exposed To Chemical Through Breast Milk

...Triclosan is a hormone disrupting pesticide widely used in antibacterial soap.

The chemical has been approved for use in 140 different types of consumer products including liquid hand soap, toothpaste, undergarments and children's toys...

Dangerous chemicals in personal care products – *Natural News* [22]

Researchers are now finding that the active ingredient in antimicrobial soaps and personal care products causes nerve damage. ...The ingredient is called MIT (methylisothiazolinone), and it is found in antimicrobial soaps, hand soaps, dish soaps and a surprising number of personal care products ...they're giving themselves nervous system disorders while actually promoting the breeding of resistant strains of bacteria. And thanks to the nervous system damage caused by these antimicrobial ingredients, people are probably accelerating Alzheimer's disease by using these products...

It's horrible. Isn't it? As a non conscious consumer, without any background in chemistry, biology or toxicology and not knowing where you should look for reliable, scientific information you would accept the whole nonsense and you would be scared having dermal contact to anything except distilled water.

Well, if you are now scared enough have a deeper look on the left and right margins of the websites. On all of these consumer friendly websites belonging to non-profit associations you'll see – besides an invitation to donate to organization so and so to guarantee a safer future for your children and your grandchildren – links to green, natural and environmental friendly products. Products which contain no harmful chemicals, in most cases no chemicals at all!!! Products which are as pure and as safe as the nature itself.

The Fairy Tale of Natural Products

Natural, organic, bio, eco, green... are customer confusing terms used by the manufacturers of personal care products. The labels are peppered with exaggerating, non realistic claims: no preservatives (nobody is interested in the fact that many of "preservative-free" products are either already contaminated or do not pass the inhibition tests), no chemicals, no water, 100% natural ingredients.

The ingredients list and the not-used-ingredients list (which is often longer than the former) are often misleading. Claims such as: "we do not use 1,4-dioxane and nitrosamines"!! are not rare.

In the EU and thanks to Cosmetic Directive misleading terms such as purified water, distilled water, structured water, plant carbohydrate complex or coconut emulsifier have no place on the ingredients list but the

INCI names don't make it much easier for the majority of consumer without any academic degree in natural sciences. It doesn't mean anyway that the consumer is better informed or more respected in Europe than elsewhere in the world. One of the most obvious cases of misleading and cheating the consumer in the EU is marking the essential oils listed on the the annex III as "100% natural essential oil" in the ingredients list without referring to the allergenic character of the oils.

As if the confusion were not enough, numerous certifications and seals like OASIS, ECOCERT, BDIH, USDA organic (NOP), NATRUE, NPA, OCA, certified organic,...with extremely different orientations and concepts add to this complexity. An ingredient that is claimed dangerous and is forbidden by one certification is quite harmless by another certification (**Figure 4**).

Almost all of these certification programs are invented by trade associations, the concepts and the standards are set by the man-



Figure 4 | Different certifications with their differing concepts are quite confusing for the consumer.

ufacturers and insure, rather than safety of the product and protecting the consumer, a higher turnover for the manufacturers in that certain association.

Back to 100% natural and free from chemical products, let us have a look at a few controversies:

- PABA as a sunscreen factor in a 100% natural sunscreen certified by BDIH.
- Ammonium lauryl sulphate, silversulphate, lanolin, alcohol, eugenol in BDIH certified personal care products.
- Detection of lead in natural lipstick and DEP and sodium borate in natural hair-spray.
- Using phenoxyethanol and sodium borate in NPA certified product and one of the greatest scandals of the green business.
- Detection of the carcinogenic 1,4-Dioxane which is actually the byproduct of the ethoxylation process earlier this year in organic products. 46 out of 99 tested products contained detectable amounts of 1,4-Dioxane, in 11 out of them the concentration of the carcinogen was over 10 ppm [23].

These are not the only cases of controversy and consumer misleading. The complexity increases with each new certification program coming into action. As long as we do not answer the questions like:

- what is the chemical difference between plant derived, animal derived and synthetic glycerine?
- Why is benzyl salicylate a "natural essential oil" in "natural products" but an "allergen" which should be indicated on the label in traditional products?
- Why are lauryl sulphate and cocamidopropyl betaine "mild surfactants extracted from coconut oil" when used in "natural products" but "harsh and sensitizing" when used in traditional products?
- Why is phenoxyethanol a "natural fragrance solvent occurring in green tea" when used in "natural products" but a "chemical preservative" in traditional products?

And as long as we do not inform the consumer in a language which is understandable by the majority of the public, we help, active or passive, all those who mislead and

cheat the consumer and we support the belief in the fairytale of "COSMETICS FREE OF CHEMICALS".

„Knowing is not enough, we must apply
Willing is not enough, we must do“

Johann Wolfgang von Goethe

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